



Gatekeeper User Manual

Scaled Dynamics, Inc

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1. Introduction

Welcome to Gatekeeper. This manual details the installation, setup, configuration, and functionalities of Scaled Dynamics' Gatekeeper. The manual is divided into the following sections:

About Gatekeeper: Introduction to Gatekeeper and its applications

Gatekeeper 3 Version Overview: New features of Gatekeeper 3

Installing Gatekeeper: Directions on how to install Gatekeeper

Gatekeeper Set-Up: Instructions detailing how to get started

Gatekeeper Overview: Quick breakdown of Gatekeeper's Main Window with explanations of their functions

Gatekeeper Detailed Review: In-depth examination of Gatekeeper functionalities

Licensing: Information about Gatekeeper licensing

Additional Information: Where to find additional information on Gatekeeper

Legal: Disclaimers and copyright notices

Gatekeeper is a cutting-edge trade execution platform that allows users to apply its core advanced formula evaluation engine to a wide array of trading strategies. At a glance, Gatekeeper may appear similar to other trading software. However, the level of customization and speed it delivers makes Gatekeeper a powerful and transformative trading tool.

For additional support, please contact support@scaledynamics.com.

WARNING: Scaled Dynamics strongly recommends testing trades and strategies in simulated environments before performing live trades.

2. About Gatekeeper

Gatekeeper enables users to manage complex trading strategies using the advanced formula evaluation engine while also allows for basic point-and-click trading. Whether users are brokers or traders, Gatekeeper is a powerful tool that delivers sub-microsecond computations and applies versatile market strategies.

Brokers

- Search, sort, and filter account data
- Manage multiple accounts with ease

Options Traders

- Configure trading strategies based on calculated fair value
- Make markets in options based on customized, formula based valuation models
- Automatically hedge delta
- Automatically set volatility skews to offset implied volatility
- Create and print valuation sheets for floor traders
- View position and risk information
- Utilize significant options trading functionality
 - Black-76, Black-Scholes, and binomial-based market making
 - Delta hedging
 - Gamma hedging
 - Automatic quoting
- Deploy scalping strategies
 - Gamma hedging
 - Book stackers
 - Event-based trades

Futures Traders

- Advanced automated trading capabilities
 - Create formula-based automated orders
 - Manage spread trades using the advanced spread engine
 - Book Stacking
 - Event Based Trades
- Trade manually using easy to use order book, fill information, and positions

3. Gatekeeper 3 Version Overview

Gatekeeper 3 has been updated to be faster, easier to use, and more dynamic.

Updated Formula Engine

- Easier to read formulas
- Faster math engine
- Saved formulas with workspaces

Gatekeeper API

- Write your own adapters for exchange connectivity that are not currently supported
- Write your own strategies utilizing existing adapters

New Order Book

- Position sliders for options traders
- Separate panels for positions, fills, and orders
- Show position by delta, gamma, vega, theta, and rho
- Download stored fills using SD_ID
- Set manual fills for floor orders

New Formula Strategies

- Configure orders for options or futures
- Set multiple orders per strategy
- Set multiple event-based orders per strategy

New Bookstacker Strategies

- Set midpoint, order size, profit offset, and interval using formula engine

New Features

- Print option valuation sheets
- Integrated SpreadBandit advanced spread engine
- CTS integration

4. Installing Gatekeeper

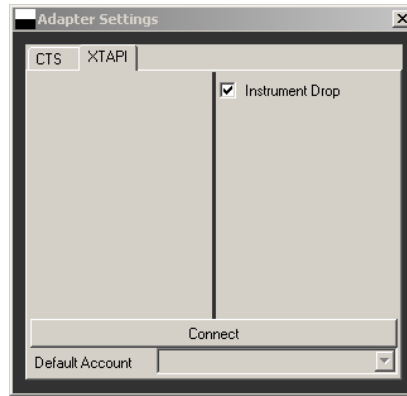
To install Gatekeeper, locate the Setup.exe file provided by Scaled Dynamics. Double-clicking this will launch the installation window:


Follow the on-screen instructions to complete the installation of Gatekeeper.

5. Gatekeeper Setup

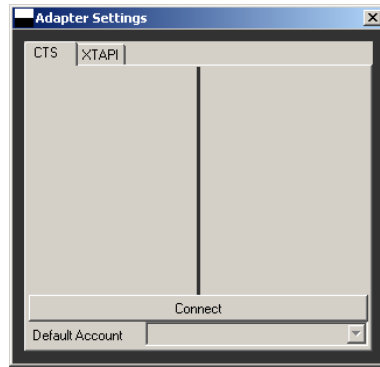
Once Gatekeeper is installed, the next step is to connect it to the market through the user's primary trading software. This can be done through X_Trader or CTS. Follow appropriate instructions below:

1. How to: Connect Gatekeeper to X_Trader and Link Instruments



1. **Open X_Trader:** Start X_Trader and sign in.
2. **Open Gatekeeper:** Start Gatekeeper and sign in.
3. **Open Adapter Settings Window:** Select the *Adapter Settings* button. 
4. **Select Instrument Drop:** To add instruments to Gatekeeper, keep the *Instrument Drop* box checked. This will open the X_Trader drop window.
5. **Select Default Account:** Use the dropdown menu at the bottom of the *Adapter Settings* window to select the default account if it is not already set.
6. **Connect:** Click the *Connect* button to connect to X_Trader.
7. **Link Instruments:** Upon connecting to X_Trader, a drop window will appear. To link instruments from X_Trader to Gatekeeper, click and drag contracts from the X_Trader explorer into the drop window. Instruments added to Gatekeeper from the drop window will be available for strategies and visible in the market grid.

2. How to: Connect Gatekeeper to CTS



1. **Open CTS:** Start CTS and sign in.
2. **Open Gatekeeper:** Start Gatekeeper and sign in.



3. **Open Adapter Settings Window:** Select the *Adapter Settings* button.
4. **Select Default Account:** Use the dropdown menu at the bottom of the *Adapter Settings* window to select the default account if it is not already set.
5. **Connect:** Click the *Connect* button to connect to CTS.

Note: The primary way Gatekeeper links with instruments is through the Instrument Explorer (covered in section 7.6). If a fill originating from outside of Gatekeeper is detected, Gatekeeper will automatically subscribe to the instrument and it will automatically become available.





6. Gatekeeper Main Window











This section covers the *Main Window* and the basic functions of all of the buttons therein. Those windows needing further explanations are addressed in full in section 7 of this manual.

1. Main Window



The SD Gatekeeper *Main Window* is the main point of entry into the Gatekeeper software. From here, all of Gatekeeper's windows and functionalities can be accessed. This window contains 14 access buttons and a retractable *Audit Trail* (arrow to the right of buttons). Closing this window will close Gatekeeper.

2.  **Open Workspace:** Open the *Workspace Central* window — open saved or shared workspaces and share workspaces.
3.  **Save Workspace:** Save the current workspace. All strategies, saved formulas window configurations, adapter settings, and instrument subscriptions will be saved with the workspace.
4.  **Save Workspace As:** Save a workspace configuration as a new workspace.
5.  **Order Book:** View, sort, modify, and cancel active orders. View position, fill information, and P&L information.

6.  **Market Window:** Search, filter, and place orders in instruments that are linked to Gatekeeper.
7.  **Instrument Explorer:** Link instruments to Gatekeeper from outside sources.
8.  **Strategy Window:** View, sort, and toggle established strategies.
9.  **Strategy Builder:** Create and save strategies.
10.  **Formula Audit:** Create and test formulas and calculate fair value on live price feeds.
11.  **Sound Manager:** Set up sound alerts for Gatekeeper actions.
12.  **Adapter Settings:** Configure available adapters for Gatekeeper.
13.  **About:** View Gatekeeper information.
14.  **Minimize Windows:** Minimize all Gatekeeper windows.
15.  **Always On Top:** Toggle Gatekeeper *Main Window* to always be on top of the desktop.
16. **Show/Hide Audit Trail:** Display or hide Gatekeeper *Audit Trail*. It's recommended to always display the *Audit Trail*.

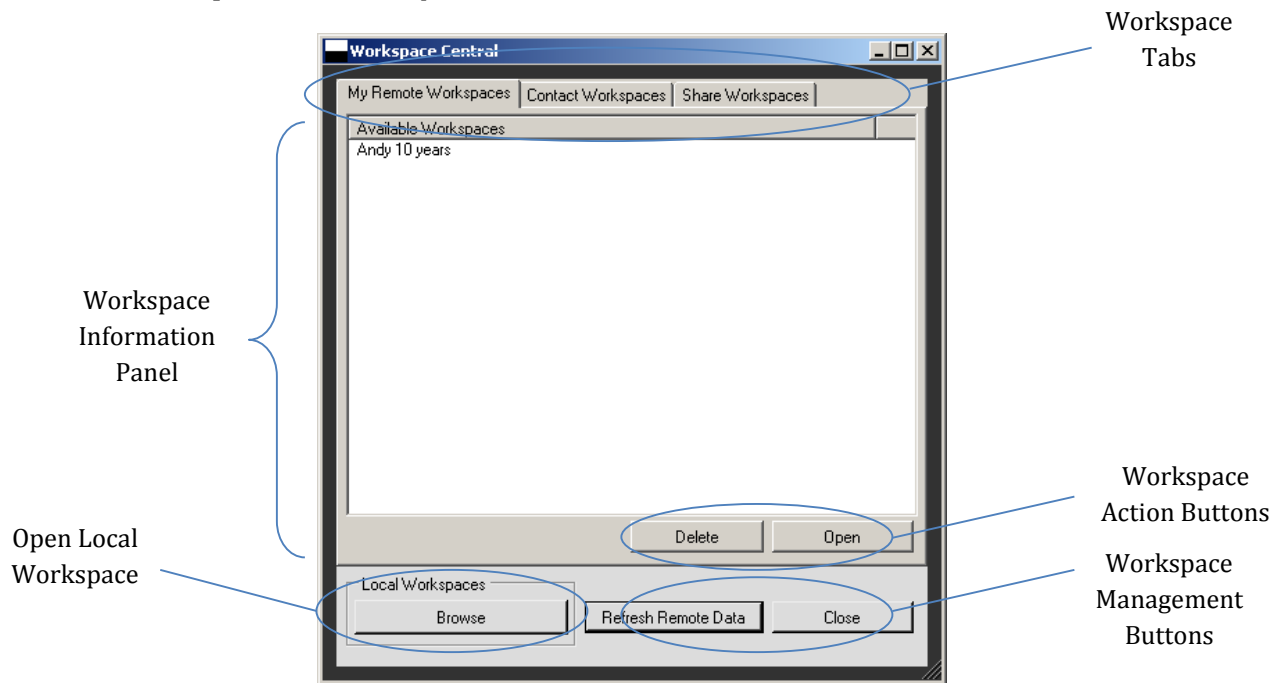
Note: Gatekeeper cannot access instruments or compile fill and order actions from outside sources without first connecting to the adapter and linking instruments from the adapter (covered in section 5.1 for X_Trader and section 5.2 and 7.6 for CTS).

7. Gatekeeper Detailed Review

This section delves deeper into Gatekeeper's features and describes how to utilize them to their full potential.

1. Open Workspace

Once a workspace has been saved or a user has been granted permission to access saved workspaces, workspaces can be accessed through the *Open Workspace* button. This button opens the *Workspace Central* window.



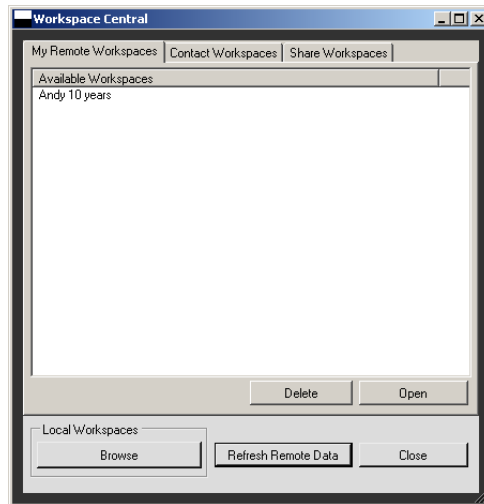
2. **Workspace Tabs:** There are three ways users can access different workspaces.
 - a. **My Remote Workspaces** – Access all remotely saved workspaces. Remote workspaces are saved on Scaled Dynamics' server, which enables users to share workspaces with one another.
 - b. **Contact Workspaces** – Access all workspaces that have been shared with the user by other users.
 - c. **Share Workspaces** – Share workspaces with other users on your contact list
3. **Workspace Information Panel:** Display available workspaces and management options.
4. **Workspace Action Buttons:** Open, delete, share, or unshare workspaces in the corresponding *Workspace Information Panel* under the *Workspace Tab* that has been selected.
5. **Open Local Workspace:** Find and open saved workspaces that have been saved on the computer.

6. **Workspace Management buttons:** Refresh remote data listing and close *Workspace Central*.

7. **Workspace Tabs**

Any workspace that has been saved remotely is accessible through one of the three workspace tabs.

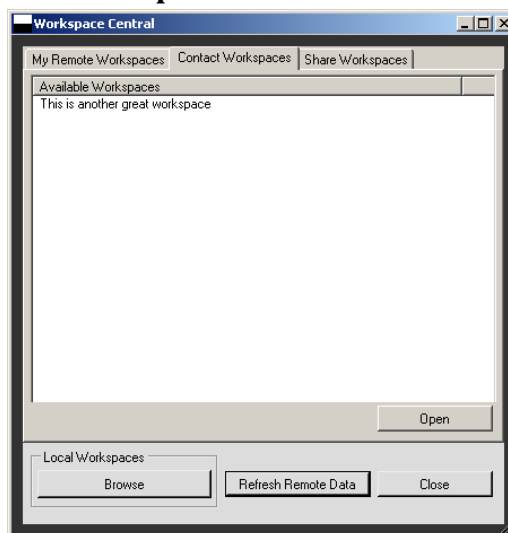
8. **My Remote Workspaces:**



Workspaces that have been saved remotely appear under this tab with the heading *Available Workspaces*. In the *Workspace Information Panel*, users can open or delete workspaces.

- a. **Open Workspace:** Select the desired workspace and click the *Open* button.
- b. **Delete:** Select the desired workspace and click the *Delete* button.

9. **Contact Workspaces:**

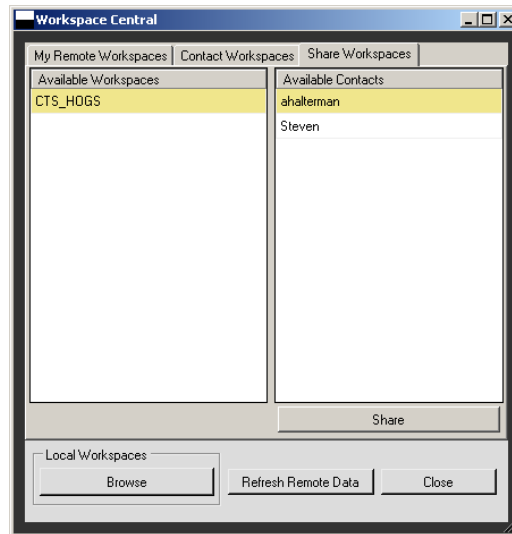


Workspaces that have been shared with users appear under this tab with

the heading *Available Workspaces*. In the *Workspace Information Panel*, users can open workspaces that have been shared.

- a. **Open:** Select the desired workspace and click the *Open* button.

10. Shared Workspaces:



Sharing workspaces with other users is done through this tab. The *Workspace Information Panel* displays both *Available Workspaces* and *Available Contacts*.

- a. **Share/Unshare:** Select one of the available workspaces and click the *Share/Unshare* button to either share or unshare it.

11. Open Local Workspaces

Opening a workspace that has been saved locally is done by selecting the *Browse* button and choosing the Gatekeeper workspace file that has been saved.

Note: All Gatekeeper workspaces are saved as .gkwx files (compressed and most commonly used) or .gkw (uncompressed).

12. Save Workspace

After a user saves a workspace using the *Save Workspace As* function and further changes are made, they can save the new version of the workspace over the existing version by clicking the *Save Workspace* button. This automatically overwrites the previously saved version of the workspace with the same file name.

13. Save Workspace As

After creating a workspace, a user can save the workspace locally or remotely. *Save Workspace As* includes information like adapter settings, instrument subscriptions, formulas, strategies, and window configurations.

14. How to: Save Workspace As

15. Select the *Save Workspace As* button

16. Choose to save the workspace locally (on the user's computer) or remotely (on a server or shared network).
 - a. If saving locally: Enter file name and select location for the workspace file.
 - b. If saving remotely: Enter file name and include any additional comments.

17. Order Book

The *Order Book* displays Gatekeeper orders, fills, and P&L and allows users to sort and filter the data displayed as well as modify existing orders. It consists of dropdown menus and *Order Modification*, *Order Book*, *Fill Book*, and *P&L* panels. A live market ladder will appear for the order if it is double clicked.

The screenshot shows the 'Order Book' window with the following panels and data:

Order Modification Panel: Includes buttons for 'Delete Filtered', 'Delete All', 'Delete', and 'Change'. It also features a large red box with the number '0' and a white box with the number '5750'.

Order Book Panel: Displays a table of orders for 'ZC Dec13 (Exchange: CBOT; Product: ZC; Future)'. The table includes columns for Change Time, Instrument, Status, Adapter, Source, Price, TF, Account, Order Type, Order Qty, Wk Qty, Fill Qty, Strategy, Stop Price, and Send Time.

Change Time	Instrument	Status	Adapter	Source	Price	TF	Account	Order Type	Order Qty	Wk Qty	Fill Qty	Strategy	Stop Price	Send Time
1/8/2013 8:22 AM	CBOT ZC Sep13	Working	XTAPI	Manual	5966	GTD	<Default>	Limit	6	6	0			1/8/2013 8:...
1/8/2013 8:22 AM	CBOT ZC Sep13	Working	XTAPI	Manual	5940	GTD	<Default>	Limit	1	1	0			1/8/2013 8:...
1/8/2013 8:21 AM	CBOT ZC Dec13	Working	XTAPI	Manual	5734	GTD	<Default>	Limit	5	5	0			1/8/2013 8:...
1/8/2013 3:21 PM	CBOT ZC Dec13	Filled	XTAPI	Manual	5750	GTD	<Default>	Limit	5	0	5			1/8/2013 8:...

Fill Book Panel: Displays a table of fills with columns for Time, Instrument, Fill Qty, Price, Strategy, Source, Account, Adapter, and Side.

Time	Instrument	Fill Qty	Price	Strategy	Source	Account	Adapter	Side
2013/01/08 15:21:42:000	CBOT ZC Dec13	1	5750		Manual	<Default>	XTAPI	Buy
2013/01/08 15:21:42:000	CBOT ZC Dec13	2	5750		Manual	<Default>	XTAPI	Buy
2013/01/08 15:21:42:000	CBOT ZC Dec13	1	5750		Manual	<Default>	XTAPI	Buy
2013/01/08 15:21:42:000	CBOT ZC Dec13	1	5750		Manual	<Default>	XTAPI	Buy

P&L Panel: Displays a table of P&L data with columns for Instrument, Net Pos, Buy Qty, Sell Qty, Buy WRK, Sell WRK, Avg Buy Prc, Avg Sell Prc, PNL, OpenPNL, RealizedPNL, Delta, Gamma, Vega, and Theta.

Instrument	Net Pos	Buy Qty	Sell Qty	Buy WRK	Sell WRK	Avg Buy Prc	Avg Sell Prc	PNL	OpenPNL	RealizedPNL	Delta	Gamma	Vega	Theta
CBOT ZC Sep13	0	0	0	1	6	NaN	NaN	0	0	0	0	0	0	0
CBOT ZC Dec13	5	5	0	5	0	5.75	NaN	-0.025	-0.025	0	5	0	0	0
Totals	5	5	0	6	6			-0.02	-0.02	0	5	0	0	0

18. Drop Down Menus

1. Window

- a. **Rename:** Enter in a new name for the *Order Book* window in the blank field that appears to the right of this option once it has been selected. This is helpful for traders who have multiple *Order Books* running simultaneously.
- b. **Bold Text:** Make all text in the *Order Book* bold.
- c. **Large Text:** Make all text in the *Order Book* larger.

2. View

- a. **Show Order Modifiers:** Show or hide the *Order Modification Panel* in the *Order Book*.
- b. **Show Orders:** Show or hide orders in the *Order Book* (orders can only be hidden when the *Fill Book* or the *P&L Panel* are displayed).

- c. **Show Fill Book:** Show or hide the *Fill Book Panel* in the *Order Book* window.
 - d. **Show P&L:** Show or hide the *P&L Panel* in the *Order Book*.
3. **P&L:**
- a. **Bid/Ask Settle:** If the *P&L Panel* is displayed, this feature allows users to set how their open P&L's are calculated. When this menu item is selected (default setting), open position P&L's are calculated using the current Bid/Ask prices of the market. When this menu item is deselected, open position P&L's are calculated by using the most recent settlement price of the market.
 - b. **FIFO (LIFO):** If the *P&L Panel* is displayed, this feature allows users to select how their current P&L is calculated. When this menu item is selected (default setting), each new trade (buy or sell) will be matched to the earliest counterpart of that trade. For instance, if the user sells a contract, that sale's P&L will be calculated against the earliest purchase of the same contract, if any (first in first out, FIFO). When this menu item is deselected, the P&L is calculated in the opposite manner (last in first out, LIFO), which calculates P&L by matching new orders with their most recent existing counterparts.

19. Order Modification Panel

Orders in the *Order Book* can be changed or deleted by using the *Order Modification Panel*. There are four modification buttons and two modification fields in the panel.

ZC Dec13 (Exchange: CBOT; Product: ZC; Future)					
Delete Filtered	Delete All	↑	3	↑	5750
Delete	Change	↓		↓	

- 20. **Delete Filtered:** Delete every order that has been filtered using the *Order Data Panel's* filter/search fields. This button is always available.
- 21. **Delete All:** Delete every order in the Gatekeeper *Order Book*. This button is always available.
- 22. **Delete:** Delete the order that is selected in the *Order Data Panel*. This button is only available after an order has been selected.
- 23. **Change:** Alter the selected order. This button is only available after a user has selected and changed an order.
- 24. **Quantity:** Display the quantity of the selected order. Quantities can be changed by entering a quantity in the field or by clicking the arrows. It is used in conjunction with the *Change* button to make changes.

25. **Price:** Show the desired price of the selected order. Prices can be changed by entering a quantity in the field or by clicking the arrows. It is used in conjunction with the *Change* button to make changes.

26. Order Data Panel

Gatekeeper tracks orders through 20 filterable, searchable, and sortable data points. These data points are displayed as the column headings in the *Order Data Panel*. Depending upon the column, users can search or filter the data by right clicking on the column heading and selecting or entering criteria. Also, users can sort most columns from first to last or vice versa by clicking the directional arrows that appear on the right side of the column headings when moused over. To show or hide data columns in *Order Data Panel*, right click in the column headings to reveal a drop down menu, then select or deselect desired columns.

Change Time	Instrument	Inst Type	Status	Adapter	Source	Price	TIF	Account	Order Type	Order Qty	Wrk Qty	Fill Qty	Strategy	Stop Price	Order ID	Native ID	Side	Send Time	Order Ex...
1/8/2013 3:32 PM	CBOT ZC Sep13	Future	Filled	XTAPI	Manual	5966	GTD	<Default>	Limit	6	0	6			000004	OTWEM7004	Sell	1/8/2013 8...	
1/8/2013 8:22 AM	CBOT ZC Sep13	Future	Working	XTAPI	Manual	5940	GTD	<Default>	Limit	1	1	0			000003	OTWEM7003	Buy	1/8/2013 8...	
1/8/2013 8:21 AM	CBOT ZC Dec13	Future	Working	XTAPI	Manual	5734	GTD	<Default>	Limit	5	5	0			000002	OTWEM7002	Buy	1/8/2013 8...	
1/8/2013 3:21 PM	CBOT ZC Dec13	Future	Filled	XTAPI	Manual	5750	GTD	<Default>	Limit	5	0	5			000001	OTWEM7001	Buy	1/8/2013 8...	

Below is a detailed breakdown of the *Order Data Panel*, from left to right, and the filter/search field options.

Note: Columns can be rearranged by clicking and dragging columns them into position.

1. **Change Time:** The last time the order was modified.
2. **Instrument:** The instrument (if any) from which the order originates.
3. **Instrument Type:** The instrument type of the order. Instrument types include:
 - a. **Unknown**
 - b. **Future**
 - c. **Option**
 - d. **Binary Option**
 - e. **Spread**
 - f. **Gatekeeper Spread**
4. **Status:** Current status of the order. Statuses include:
 - a. **Working**
 - b. **Filled**
 - c. **Partial**
 - d. **Hold**
 - e. **Deleted**
 - f. **Expired**

- g. **Rejected**
- h. **Pending**
- 5. **Adapter:** Origin of the order.
- 6. **Source:** How the order was placed. Sources include:
 - a. **Manual**
 - b. **Book Stacker**
 - c. **Formula**
 - d. **Formula Event**
 - e. **External**
 - f. **User**
 - g. **Spreader**
 - h. **Other**
- 7. **Price:** The desired price of the order.
- 8. **TIF:** Time-in-force is the duration an order will remain active before it is executed or expires. TIF options include:
 - a. **GTD**
 - b. **GTC**
 - c. **Unknown**
 - d. **Other**
- 9. **Account:** The account associated with the order.
- 10. **Order Type:** The type of order placed. Order types include:
 - a. **Limit**
 - b. **Market**
 - c. **Stop**
 - d. **Stop Limit**
 - e. **Manual Fill**
 - f. **Unknown**
 - g. **Other**
- 11. **Order Qty:** The quantity of the order.
- 12. **Wrk Qty:** The quantity of the order that is working.
- 13. **Fill Qty:** The quantity of the order that has been filled.
- 14. **Strategy:** The name of the strategy associated with the order.
- 15. **Stop Price:** If set, the stop price associated with the order.
- 16. **Order ID:** Identification number assigned to the order.
- 17. **Native ID:** The order ID given to the order by X_Trader or CTS.
- 18. **Side:** Whether the order is on the buy or sell side of the trade.
- 19. **Send Time:** Time the order was sent to the market.
- 20. **Order Expiry:** Time the order is set to expire (if at all).

27. Fill Book Panel

A record of users' filled orders can be displayed in the *Order Book* window. This panel is hidden by default and can be shown or hidden by using the *Window* dropdown menu. Columns can be rearranged by clicking and dragging the columns to their desired destinations.

Time	Instrument	Inst Type	Fill Qty	Price	Strategy	Source	Account	Adapter	Side	OrderID	FillKey
2013/01/08 15:32:21.000	CBOT ZC Sep13	Future	1	5966		Manual	<Default>	XTAPI	Sell	000004	1vzak1voa8sk6
2013/01/08 15:32:21.000	CBOT ZC Sep13	Future	2	5966		Manual	<Default>	XTAPI	Sell	000004	ei856ayagiv0
2013/01/08 15:32:21.000	CBOT ZC Sep13	Future	2	5966		Manual	<Default>	XTAPI	Sell	000004	1gwnr8p1433yl
2013/01/08 15:32:21.000	CBOT ZC Sep13	Future	1	5966		Manual	<Default>	XTAPI	Sell	000004	1sbxdi7g3arb
2013/01/08 15:21:42.000	CBOT ZC Dec13	Future	1	5750		Manual	<Default>	XTAPI	Buy	000001	7uhark1v9bcf5
2013/01/08 15:21:42.000	CBOT ZC Dec13	Future	2	5750		Manual	<Default>	XTAPI	Buy	000001	487m3279b7bn

The *Fill Book* displays the following data as described in the column headings:

28. **Time:** Execution time of the trade.
29. **Instrument:** Instrument on which the trade was executed.
30. **Inst Type:** Instrument type (future, option, etc.).
31. **Fill Qty:** The total number of individual fills in the order.
32. **Price:** The fill price of the order.
33. **Strategy:** The strategy associated with the order, if any.
34. **Source:** Origin of the order (manual or strategy).
35. **Account:** The account that filled the order.
36. **Adapter:** The adapter (X_Trader or CTS) Gatekeeper used.
37. **Side:** The type of order (buy or sell).
38. **Order ID:** Identification number assigned to the order.
39. **Fill Key:** Unique identifier for the fill provided by the adapter.

40. P&L Panel

The *Order Book* window also provides information related to the profit and loss of each order through the *P&L Panel*. This panel is hidden by default in the *Order Book* and can be shown by selecting the *Window* drop down menu and selecting the *Show P&L Panel* option. Columns can be rearranged by clicking and dragging columns to their desired destinations.

Instrument	Net Pos	Buy Qty	Sell Qty	Buy WRK	Sell WRK	Avg Buy Prc	Avg Sell Prc	PHL	OpenPHL	RealizedPHL	Delta	Gamma	Vega	Theta
CBOT ZC Sep13	-6	0	6	1	0	NaN	5.97	0	0	0	-6	0	0	0
CBOT ZC Dec13	5	5	0	5	0	5.75	NaN	-0.025	-0.025	0	5	0	0	0
Totals	-1	5	6	6	0			-0.02	-0.02	0	-1	0	0	0

The *P&L Panel* provides the following data as represented by the column headings:

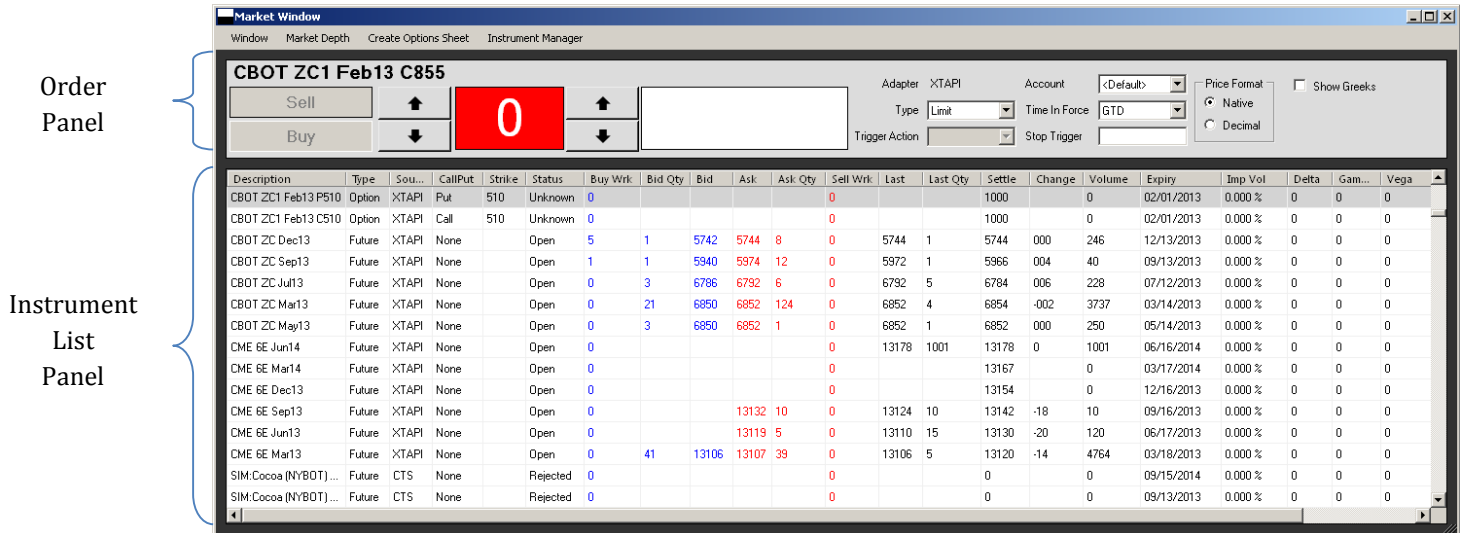
1. **Instrument:** Name of the contract associated with the order.
2. **Net Position:** Current net position users have in the market. If users are long, this field is blue, if users are short, this field is red.

3. **Buy Qty:** Number of contracts users have entered to buy.
4. **Sell Qty:** Number of contracts users have entered to sell.
5. **Buy WRK:** Number of contracts users are currently trying to buy.
6. **Sell WRK:** Number of contracts users are currently trying to sell.
7. **Avg Buy Prc:** If users have buys at multiple prices, this column computes and displays the average buy price.
8. **Avg Sell Prc:** If users have sells at multiple prices, this column computes and displays the average sell price.
9. **PNL:** Users' current P&L of the filled order.
10. **Open P&L:** Amount of P&L that has not been transacted.
11. **Realized P&L:** Amount of P&L that has been transacted.
12. **Delta:** The current delta value.
13. **Gamma:** The current gamma value.
14. **Vega:** The current vega value.
15. **Theta:** The current theta value.

41. **How to: Modify Orders**
42. **Select Order:** Choose an order or multiple orders to be modified by selecting them in the *Order Book Panel*
43. **Delete or Modify:** To delete an order, click the *Delete* button. To modify the order, use the arrow buttons next to the quantity and price boxes or select the boxes themselves and enter the desired quantity.
44. **Change Order:** Once the desired changes have been entered, select the "Change" button to modify the order.

45. Market Window

The *Market Window* displays all the instruments that have been linked to Gatekeeper. From this window, users can place orders, view market depth on a ladder, create an option sheet, and match instruments in Gatekeeper. The window consists of dropdown menus, an *Order Panel*, and an *Instrument List Panel*.



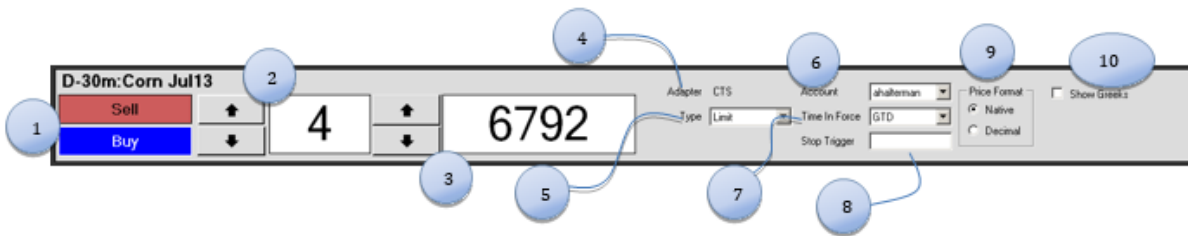
46. Dropdown Menus

1. Window

- Rename:** Enter a new name for the *Market Window* in the blank field that appears to the right of this option once it is selected. This is helpful for traders who have multiple *Market Windows* open simultaneously.
 - Bold Text:** Make all text in the *Market Window* bold.
 - Large Text:** Make all text in the *Market Window* larger.
 - Show Order Panel:** Show or hide the *Order Panel*.
- Market Depth:** Open a *Market Depth Ladder* for the selected instrument in the *Instrument List*. Using this ladder is covered in section 7.5.4 and 7.5.5.
 - Create Options Sheet:** Open the *Options Sheet Printer*, which allows users to make printer-friendly options tables with desired information. Creating an *Options Sheet* is covered in section 7.5.6 and 7.5.7.
 - Instrument Manager:** Open the *Instrument Manager*, which allows users to match options with their corresponding futures. Using the *Instrument Manager* is covered in section 7.5.8.

47. Order Panel

The *Order Panel* is used for the entry or change of orders in a particular instrument. Once an instrument is selected, orders can be placed through the order panel.



1. **Buy/Sell:** Choose between buying and selling the instrument.
2. **Quantity:** Display and change the quantity of the order.
3. **Price:** Display and change the price of the order.
4. **Adapter:** Display the originating adapter of the instrument.
5. **Type:** Choose the order type. This includes limit, market, stop, stop limit, and manual fill.
6. **Account:** Switch between different accounts.
7. **Time In Force:** Switch between GTC and GTD orders.
8. **Stop Trigger:** Set the stop price for stop or stop limit orders.
9. **Price Format:** Change how price is displayed in Gatekeeper. The "Native" option displays price according to CME price display standards (ex: corn price would be displayed as 6546 for \$6.5475). The "Decimal" option displays price in decimals (ex: corn price would be displayed as 65475 for \$6.5475).
10. **Show Greeks:** Add the Greeks to the data in the *Instrument List* panel and allow users to select a Greek-based formula.

11. Instrument List Panel

Every instrument linked to Gatekeeper appears on this list. Users can set up filters, rename, and save individual instrument list panels or use it in its totality. Depending on the field, users can search, filter or sort by defined data points. Right clicking on the column headings also allows users to show or hide columns as well as freeze columns. Columns can be rearranged by clicking and dragging columns to their desired destinations.

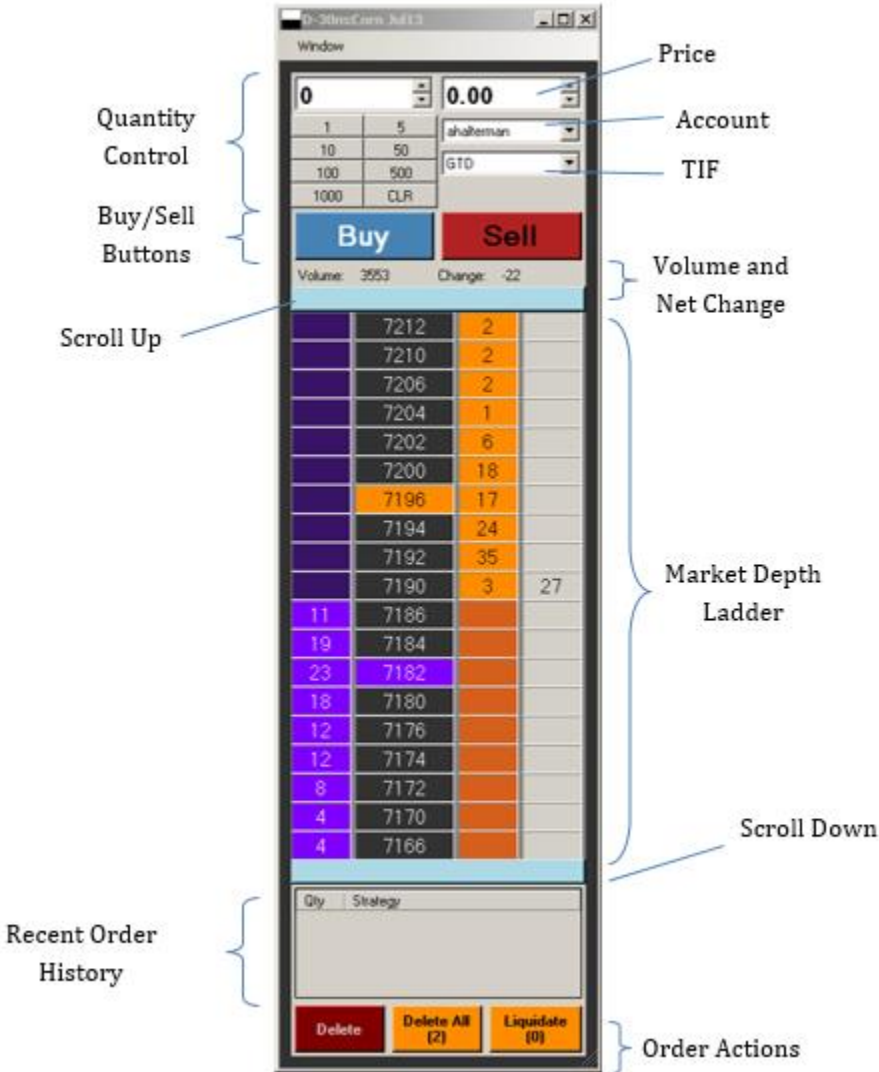
Description	Type	Source	CallPut	Strike	Status	Buy Wk	Bid Qty	Bid	Ask	Ask Qty	Sell Wk	Last	Last Qty	Settle	Chan...	Volume	Expiry
CBOT ZC1 Feb13 P510	Option	XTAPI	Put	510	Unknown	0				0				1000		0	02/01/2013
CBOT ZC1 Feb13 C510	Option	XTAPI	Call	510	Unknown	0				0				1000		0	02/01/2013
CBOT ZC Dec13	Future	XTAPI	None		Open	4	1	5740			0	5742	1	5744	-002	298	12/13/2013
CBOT ZC Sep13	Future	XTAPI	None		Open	0				0		5940	1	5966	-026	41	09/13/2013
CBOT ZC Jul13	Future	XTAPI	None		Open	0				0		6792	1	6784	006	273	07/12/2013
CBOT ZC Mar13	Future	XTAPI	None		Open	0	1	6852	6856	5	0	6852	20	6854	-002	4102	03/14/2013
CBOT ZC May13	Future	XTAPI	None		Open	0				0		6852	5	6852	000	254	05/14/2013
CME 6E Jun14	Future	XTAPI	None		Open	0				0		13178	1001	13178	0	1001	06/16/2014
CME 6E Mar14	Future	XTAPI	None		Open	0				0				13167		0	03/17/2014
CME 6E Dec13	Future	XTAPI	None		Open	0				0				13154		0	12/16/2013
CME 6E Sep13	Future	XTAPI	None		Open	0			13132	10	0	13124	10	13142	-18	10	09/16/2013
CME 6E Jun13	Future	XTAPI	None		Open	0	5	13110	13120	5	0	13110	15	13130	-20	120	06/17/2013
CME 6E Mar13	Future	XTAPI	None		Open	0	10	13100	13108	11	0	13108	30	13120	-12	5045	03/18/2013
SIM:Cocoa (NYBOT) S...	Future	CTS	None		Rejected	0				0				0		0	09/15/2014
SIM:Cocoa (NYBOT) S...	Future	CTS	None		Rejected	0				0				0		0	09/13/2013
SIM:Cocoa (NYBOT) M...	Future	CTS	None		Rejected	0				0				0		0	05/14/2014
SIM:Cocoa (NYBOT) M...	Future	CTS	None		Rejected	0				0				0		0	05/15/2014

12. **Description:** Display the contract name.
13. **Type:** The instrument type. Instrument types include:
 - a. **Unknown**
 - b. **Future**
 - c. **Option**
 - d. **Binary Option**
 - e. **Spread**
 - f. **Gatekeeper Spread**
14. **Source:** Display which adapter Gatekeeper is using.
15. **CallPut:** Display whether the instrument is a call or a put option.
16. **Strike:** Display the current strike price of the instrument.
17. **Status:** Display the current status of the order. Order statuses include:
 - a. **Unknown**
 - b. **Pre Open**
 - c. **Open**
 - d. **Restricted Open**
 - e. **Pre Closed**
 - f. **Closed**
 - g. **Failed**
 - h. **Pre Cross**
 - i. **Cross**
 - j. **Expired**
 - k. **Rejected**
 - l. **Unavailable**

- m. **No Permission**
 - n. **Other**
18. **Buy Wrk:** Number of contracts users are currently trying to buy.
 19. **Buy Qty:** Number of contracts users have entered to buy.
 20. **Bid Qty:** Amount currently bid at price.
 21. **Bid:** Current bid price.
 22. **Ask:** Current ask price.
 23. **Ask Qty:** Amount currently offering at price.
 24. **Sell Wrk:** Number of contracts users are currently trying to sell.
 25. **Last:** The most recently traded price.
 26. **Last Qty:** The amount contracts most recently traded at a price.
 27. **Settle:** Settlement price of instrument (if any).
 28. **Change:** Change in price from the SETTLEMENT OR OPEN OF DAY?
 29. **Volume:** Number of trades in the trade day for the instrument.
 30. **Expiry:** Expiration date of the contract.
 31. **Implied Volatility:** Percentage implied volatility.
 32. **Delta:** The current delta value.
 33. **Gamma:** The current gamma value.
 34. **Vega:** The current vega value.
 35. **Theta:** The current theta value.
 36. **Rho:** The current rho value.

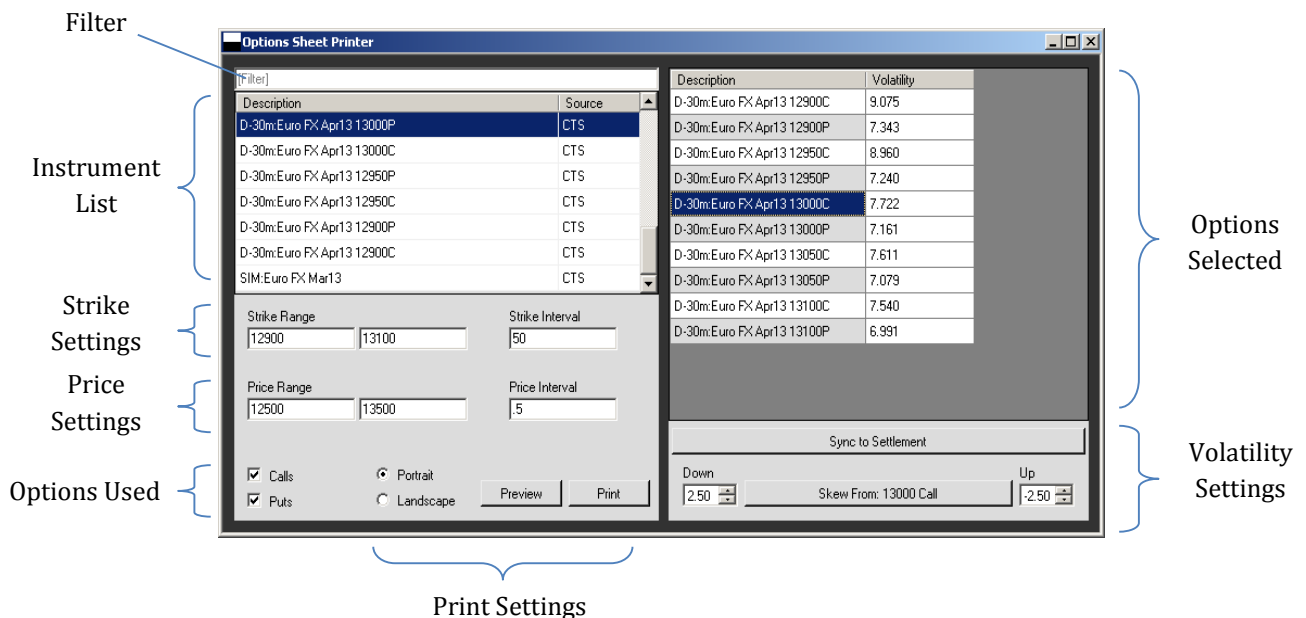
37. Market Depth Window Overview

Market Depth Windows are another way to see a market's price action. In Gatekeeper, it can be used to enter or edit orders. When an order is working at a price in the *Market Depth Window*, the price is highlighted (7196 and 7182 in the picture below). To center the ladder currently selected, press the space bar. To center all Market Depth Windows, center click on the mouse. Users can change colors of the *Market Depth Window* by using the *Window* drop down menu and selecting *Edit Colors*.



38. **Quantity Control:** Set the quantity of the order by entering it or selecting a quantity button.
39. **Price:** Set the price by selecting it in the market depth ladder, entering it, or moving it up and down with the arrows.
40. **Account:** Select the account associated with the order.
41. **TIF:** Select GTD or GTC.
42. **Buy/Sell Buttons:** Select whether the order is a buy or a sell order.
43. **Volume/NetChange:** Display the volume and net change for the instrument.

44. **Market Depth Ladder:** Display the current market depth for the instrument.
45. **Scroll Up/Down:** Select the blue buttons to scroll the market up or down
46. **Recent Order History:** Display recent orders that were placed.
47. **Order Actions:** Delete one or all of the orders in the market depth ladder and liquidate any positions in the market (note: users will be asked to confirm they wish to delete all or liquidate their positions).
48. **How to: Enter an order through a Market Depth Window**
49. **Open a Market Depth Window:** Find the instrument in the *Market Window* and double click on it.
50. **Select Account:** Use the drop down menu to select the appropriate account.
51. **Select TIF:** Choose GTC or GTD order.
52. **Set Quantity:** Enter or click on the quantity desired.
53. **Set Price:** Click on the price in the market depth window, enter it, or use the arrows to adjust to the desired price.
54. **Buy or Sell:** Select whether the order is a buy or a sell order.
55. **Options Sheet Printer Window Overview**

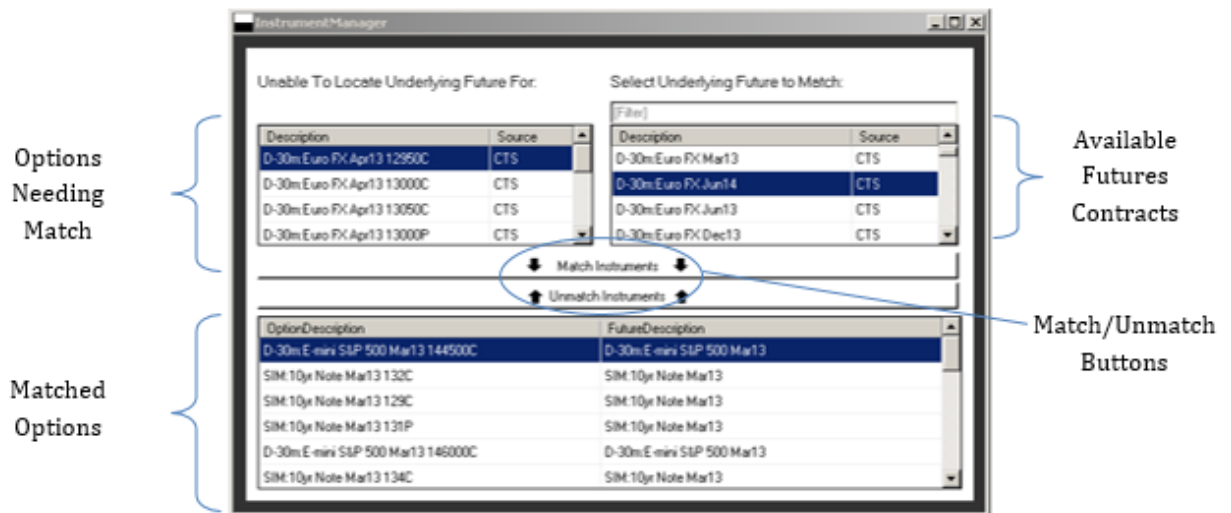


56. **Filter:** Filter the instrument list for the desired instruments.
57. **Instrument List:** List of all available instruments.
58. **Strike Settings:** Set the range of strike prices and the interval for the Options Sheet.
59. **Price Settings:** Set the range of futures prices and the interval to be used.
60. **Options Used:** Select whether to include calls, puts, or both.
61. **Options Selected:** Display a list of options used as well as the volatility used. Users can change the volatility by manually entering it in this space, or sync volatility to the market and set a skew.

62. **Sync Volatility:** synchronize the options in the *Options Selected* panel to current market data.
63. **Volatility Skew:** Select an option to use as a starting point (D-30m: Euro FX Apr13 13000 C, in the example above) and set their own volatility skew in relation to the starting point (down 2.5 and up -2.5 in the example above).
64. **Print Settings:** Select portrait or landscape and print or preview the *Options Sheet*.
65. **How to: Create an Options Sheet**
66. In the *Market* window, select the *Create Options Sheet* option.
67. Select the desired option on the *Instrument List*. The *Options Selected* panel should populate with the desired option.
68. Set desired strike range and price range.
69. Set the desired strike and price interval of the option. The interval is in price increments of the underlying instrument.
70. Choose if the sheet will show calls, puts, or both.
71. Set volatility:
 - a. Sync to Settlement: When this option is selected, Gatekeeper automatically retrieves the most current market data on an option's volatility.
 - b. Skew From: Users can choose to set volatility based on a skew from a particular option and give or take volatility above and below it. When an option is selected in the *Options Selected* panel, it automatically appears on the *Skew From* button. From there, users can set positive or negative volatility skews on either side of the option.
72. Preview and print the option sheet, it will open a print dialog window.

73. **Instrument Manager**

When Gatekeeper cannot match an options contract with a futures contract (if users are using options that have different delivery months than the futures, for instance), users can match them using the *Instrument Manager*. If contracts are matched incorrectly, they can be selected among the list of matched options and unmatched by selecting the *Unmatch Instruments* button. This window will automatically appear when a workspace with unmatched instruments is loaded.

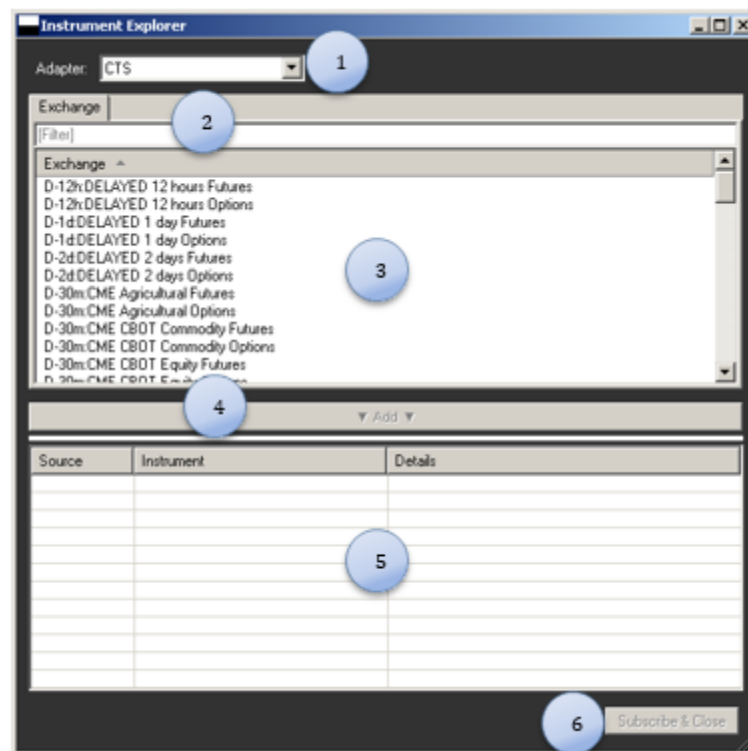


74. **How to: Match Instruments in Instrument Manager**
75. Select an options contract that is currently unmatched.
76. Select the futures contract that corresponds with the unmatched options contract. If users are unable to find the correct futures contract, it most likely has not been linked to Gatekeeper. Use *Instrument Explorer* to link the correct futures contract to Gatekeeper.
77. Select the *Match Instruments* button. The unmatched option will reappear with its match in the list of matched options.

78. Instrument Explorer

The *Instrument Explorer* is used to link instruments from an adapter (other than X_Trader to Gatekeeper. Initially, all instruments that a user wants to use must be added to Gatekeeper using this window.

Note: this window is not used to link instruments from X_Trader; go to section 5.1 (page 6) for directions on how to link instruments from X_Trader.



There are 6 available fields in this window:

1. **Adapter:** This drop down menu allows users to toggle between different Gatekeeper adapters.
2. **Filter:** Selecting this allows users to enter filtering criteria for the instruments to be matched in the panel below.
3. **Available Exchanges/Contracts/Markets Panel:** Displays all available exchanges/contracts/markets. Once an exchange has been selected, a new tab opens up in the same panel to display contracts. Once a contract has been selected, a new tab appears with available markets. Users can go back and forth by selecting the tabs.
4. **Add Instrument:** Selecting this button moves instruments highlighted in the *Found Instrument* panel to the *Selected Instruments* panel.
5. **Linked Instrument Panel:** Displays instruments that have been linked to Gatekeeper.

6. **Subscribe & Close:** Selecting this button automatically links all instruments in the *Selected Instruments* panel into Gatekeeper. These instruments will then be displayed in the *Market Window*.

79. How to: Link Instruments to Gatekeeper with Instrument Explorer

80. Find and select the instrument to be linked to Gatekeeper in *Available Exchange/Contract/Market* panel.
81. Click the *Add Instrument* button. The instrument then appears in the *Linked Instrument Panel*.
82. Click the *Subscribe and Close* button.

83. Strategy Window

After a user has created a strategy and saved it, it appears in the *Strategy Window* and is ready to be implemented. In the *Strategy Window*, users can toggle strategies, edit strategies, edit volatility, clone strategies, and delete strategies. The *Strategy Window* is comprised of action buttons at the top of the window and a strategy list.

Action Buttons {

Strategy List {

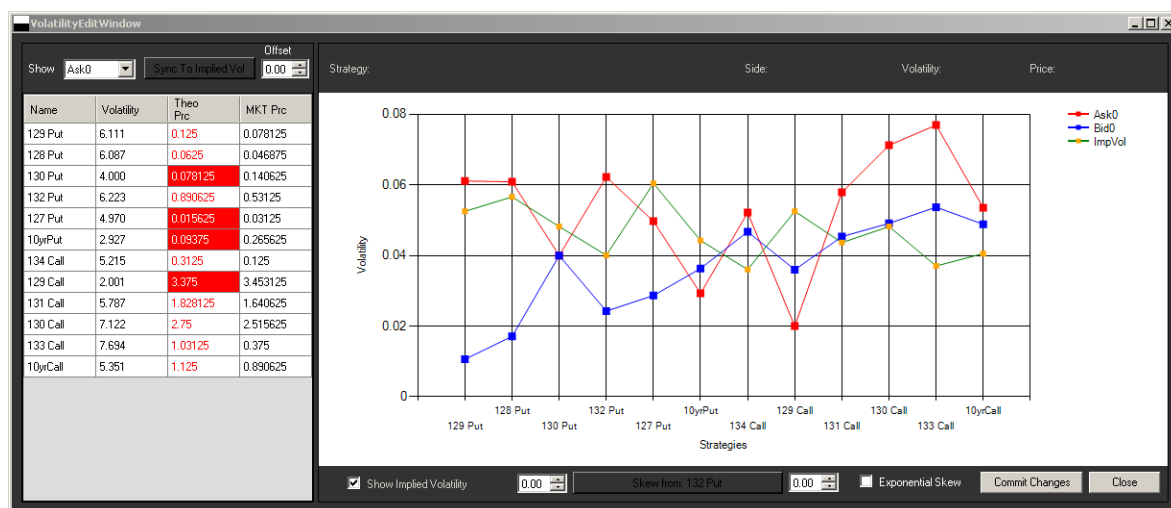
84. Action Buttons

85. Window

This drop down menu has the same options as most other *Window* menus in similar windows in that it allows users to rename the window, bold text, and increase text size. There is also the option of adding an *Order Modification Panel* to the top of the window.

86. Volatility Edit

Users can adjust the volatility settings in their strategies by selecting the *Volatility Edit* window. The window has two main sections both expressing the same information. On the left side, users can key in new volatility settings, sync to implied volatility, or set an implied volatility offset. On the right side of the window is a graphical representation of the current volatility settings. The volatility runs along the Y-axis and the strategies are on the X-axis. Users can click and drag each data point to adjust the volatility of that strategy.



This window is covered more in depth in section 7.7.3

87. Edit Strategy

If users wish to augment their strategy other than adjusting the volatility, they can do so by selecting the strategy in the strategy list and selecting the *Edit Strategy* button. This opens the *Strategy Builder* screen associated with that strategy (covered in section 7.8).

Note: A strategy cannot be edited while it is running. To edit a strategy, first stop the strategy, make sure it is selected, and then select *Edit Strategy*.

88. Clone Strategy

Cloning a strategy is done by selecting the strategy to be cloned in the *Strategy List* and then selecting the *Clone Strategy* action button. The cloned strategy will appear at the bottom of the Strategy List with an asterisk preceding the strategy's name.

89. Clone Range

Instead of having to go through the process of creating a new strategy in the *Strategy Builder* window each time, users can create one strategy and use it as a basis for a range of contracts. How to clone a range is covered in section 7.7.4.

90. Delete Strategy

Deleting a strategy from the *Strategy Window* is done by selecting the strategy and selecting *Delete Strategy*. A dialogue box will appear asking users to confirm they want to delete the strategy.

91. View Strategy

View Strategy is used when a user wishes to see the construction of a strategy while it's being implemented. Since a strategy cannot be edited while it is running, this is useful for checking the strategy while it is running.

92. Disable All

In the top right corner of the *Strategy Window*, there is the *Disable All* button. Selecting this button stops all strategies currently running.

93. **Strategy List**

The main portion of the *Strategy Window*, the *Strategy List*, displays the strategies available. Like most of the other windows in Gatekeeper, users can rearrange the columns and sort them in ascending or descending order. The columns available include:

- 94. **On/Off:** Selecting this checked box turns a strategy on or off.
- 95. **Name:** Name of the strategy.
- 96. **Description:** Name of the contract the strategy is using.
- 97. **Strike:** Strike price the strategy uses.
- 98. **Bid Qty:** The amount being bid on the market.
- 99. **Bid:** Price currently bid on the market.
- 100. **Ask:** Price currently offered on the market.
- 101. **Ask Qty:** The amount being offered on the market.
- 102. **Last:** Last price traded.
- 103. **Settle:** Settlement price of the previous trading day.
- 104. **Change:** Net change between the settlement and the last trade.
- 105. **Bid Vol:** Volatility setting of the bid.
- 106. **Theo Bid Qty:** The quantity a user would theoretically be bidding according to the strategy.
- 107. **Theo Bid:** The bid price the user would theoretically be bidding according to the strategy.
- 108. **Theo Ask:** The offer price the user would theoretically be offering according to the strategy.
- 109. **Theo Ask Qty:** The quantity a user would theoretically be offering according to the strategy.
- 110. **Ask Vol:** Volatility setting of the offer.

- 111. **Volatility Edit Reviewed**

112. Left Panel: Volatility Grid View

The screenshot shows a software interface for a 'Volatility Grid View'. At the top, there is a 'Show' dropdown menu (callout 1) set to 'Ask0', a 'Sync To Implied Vol' button (callout 2), and an 'Offset' input field (callout 3) set to '0.00'. Below this is a table with four columns: 'Name', 'Volatility', 'Theo Prc', and 'MKT Prc'. The table lists various options like '129 Put', '128 Put', '130 Put', etc. The 'Volatility' column is highlighted with a blue background (callout 4), and the 'Theo Prc' column has red text. A callout 5 points to the 'Volatility' column header. Below the table is a large empty grey area.

Name	Volatility	Theo Prc	MKT Prc
129 Put	5.499	0.078125	0.078125
128 Put	2.339	0.015625	0.046875
130 Put	4.000	0.078125	0.140625
132 Put	4.000	0.59375	0.53125
127 Put	5.000	0.015625	0.03125
10yrPut	3.267	0.125	0.265625
134 Call	5.262	0.3125	0.125
129 Call	6.229	3.484375	3.4375
131 Call	2.464	1.421875	1.625
130 Call	5.106	2.515625	2.5
133 Call	6.822	0.875	0.375
10yrCall	3.036	0.71875	0.875
*128 Put	4.000	0.015625	0.046875

1. **Show:** This drop down menu allows users to switch between different ask and bid strategies. When a user selects ask or bid, the theoretical pricing column changes to reflect this change, and the graph on the right side of the window turns the data points into enlarged diamonds so a user can identify them.
2. **Sync to Implied Vol:** When selected, the volatility of the strategies is set to the implied volatility as computed by Gatekeeper.
3. **Offset:** When syncing to implied volatility, users can choose to offset the sync by entering the percentage increase or decrease desired.
4. **Volatility Grid View:** A grid representation of the strategies. It includes the following columns:
 - a. **Name:** Name of the strategy.
 - b. **Volatility:** Current volatility of the strategy.
 - c. **Theo Prc:** The theoretical price of the option according to the strategy.
 - d. **MKT Prc:** Current market price of the option the strategy is based upon.
5. **Volatility Column:** This column is the only changeable column in the *Volatility Grid View*. Users can set volatility here by selecting this column of the appropriate strategy and entering in or using the arrows that appear to adjust it up and down.

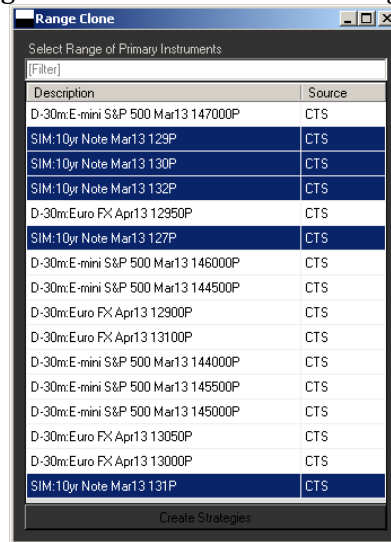
113. Right Panel: Volatility Graphical View



1. **Strategy Info:** When the cursor is placed over a data point on the graph, information of the data point is displayed here. This information includes:
 - a. **Strategy:** Strategy name.
 - b. **Side:** Whether the strategy is on the bid or offer side of the market.
 - c. **Volatility:** Current volatility setting for the strategy.
 - d. **Price:** The theoretical price of the option according to the strategy.
2. **Volatility Graph:** A graphic representation of the volatility settings for strategies.
3. **Show Implied Volatility:** Toggles an overlay on the graph of the implied volatility. The data points are orange and the lines are green (shown above).
4. **Skew From:** Volatility can be set by choosing a data point to skew from. Whatever strategy is selected in the left column appears on this button. In the example above, the 130 Put strategy is selected. From there, users can set positive or negative skews on either side of the skew point.
5. **Exponential Skew:** When setting a skew from a specific contract, users can select this option to show the exponential extrapolation of the skew.
6. **Commit Changes/Close:** Once volatility has been adjusted, select the commit changes button to change them in the strategies, then select Close to exit the *Volatility Edit* window.

114. How to: Clone Range

Cloning a strategy to a range of contracts saves time by applying an existing strategy to other contracts without having to recreate them in the *Strategy Builder* window.



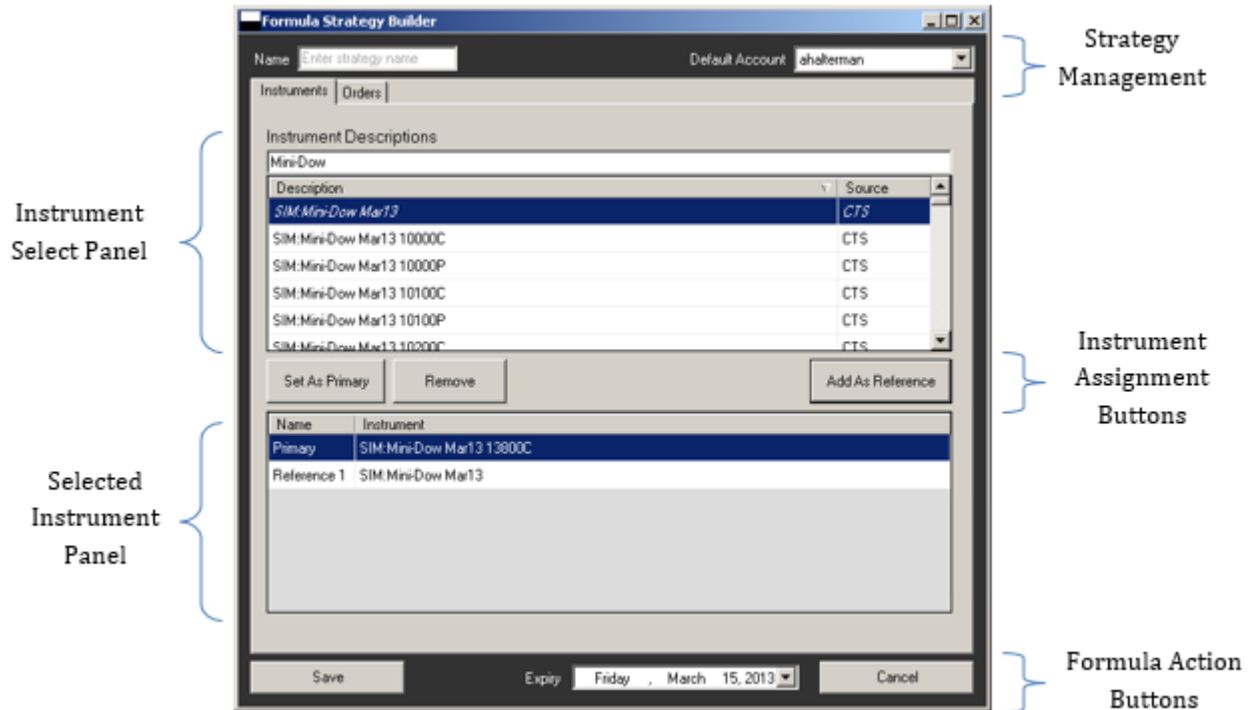
- 115. **Select Original Strategy:** In the *Strategy List*, select the contract to be cloned.
- 116. **Select Clone Range:** Bring up the *Clone Range* window by selecting *Clone Range*.
- 117. **Choose Contracts:** Select the contracts to be cloned from the original strategy.
- 118. **Create Strategies:** Once contracts have been chosen, clicking this button clones the strategy and lists them in the *Strategy List* of the *Strategy Window*. In the example above, the user is cloning a strategy originally developed for a Black-76 129 put in the March13 10 year contract and applying it to other puts in that range of strike prices.

119. Strategy Builder

There are three advanced strategies Gatekeeper can implement: formula, bookstacker, and SpreadBandit. To construct these strategies, users select the Strategy Builder icon and choose one of the three advanced strategies.

Formula and bookstacker strategies both start users in the *Instrument Select* tab. Users select the instruments used in the strategy. This usually includes setting a primary instrument and a reference instrument.

120. Instrument Select Tab



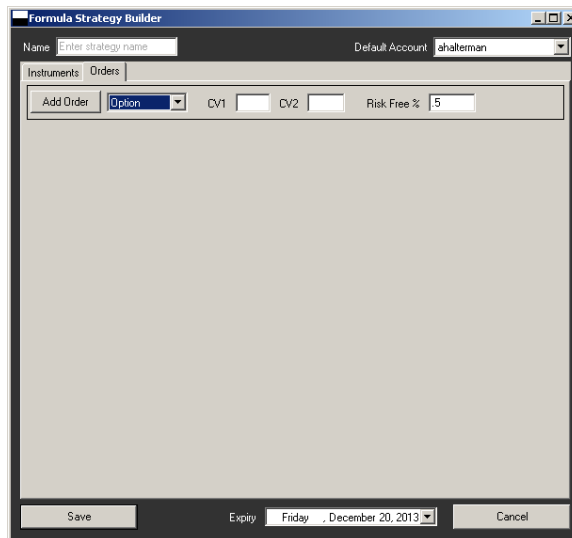
1. **Strategy Management**
 - a. **Name:** Name of the strategy.
 - b. **Account:** Account associated with strategy.
2. **Instrument Select Panel:** Search and select contracts to be used with the strategy.
3. **Instrument Assignment Buttons:** Add or remove primary and reference instruments to the *Select Instrument Panel*.
4. **Selected Instrument Panel:** Display instruments that have been chosen.
5. **Formula Action Buttons:** Save or cancel a formula strategy construction and allow users to change the expiry of a selected option if desired.

Note: This tab is used for both formula strategies and bookstacker strategies. The same process of selecting the instrument and adding it as a primary or reference instrument is used for both advanced strategy types.

121. Formula Strategy

Formula strategies implement one or more functions that automate both valuations and corresponding trading strategies. Before running a formula strategy, users must first build and save the strategy in Gatekeeper. This is primarily done in the *Formula Audit* window (covered in section 7.9).

The *Formula Strategy Builder* consists of two tabs. The first tab, the *Instrument Select* tab, is covered in section 7.8.1. Once contracts have been selected, users can configure them in the *Order* tab.

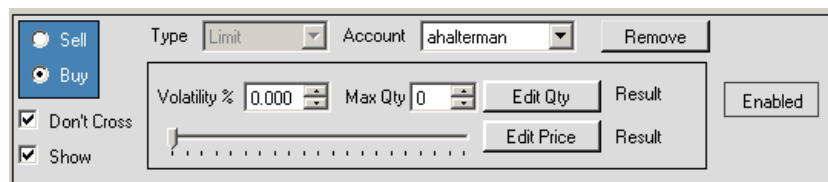


In the *Order* tab, users can add one or many formulas to be used in a formula strategy. On this initial screen, users can set the risk-free rate, any constant values, and can choose the type of order to add to the strategy. There are three different types of orders that can be created:

122. Option: Used in options contracts exclusively.
123. Event: A formula dependent on an event (such as a fill).
124. Formula: A function-based formula strategy.

Once a user adds an order, one of three panes appear depending on the order type.

1. Option:



- a. **Sell/Buy:** Select whether the order is on the buy or sell side of the option.
- b. **Don't Cross:** When checked, orders in the market do not cross one another. When unchecked, orders are allowed to cross.
- c. **Show:** When checked, working orders appear in the market. When unchecked, orders are only placed when they can be filled immediately.
- d. **Type:** There are 2 Types *Limit* and *Stop*.
- e. **Account:** Account associated with the strategy.
- f. **Remove:** Delete this pane from the window and strategy.
- g. **Volatility %:** Set volatility of the order. Either enter the percentage in the field or use the slider directly below. This can later be changed in the *Vol Edit* window located in the *Strategy Window*.
- h. **Max Qty:** Set the maximum allowed working quantity of the strategy.
- i. **Edit Qty:** When this button is clicked, a window pops up and prompts the user to enter a quantity. Users can enter an integer or a formula developed in the *Formula Audit* window by using the drop down menu at

the bottom left of the window.

- j. **Edit Price:** When this button is clicked, a window pops up and prompts the user to enter a price. Users can enter a price or a formula developed in the *Formula Audit* window.

- k. **Enabled:** Turn on the strategy when selected.

2. Event:

- a. **Side:** When an option or formula order is filled (event trigger), the event order is activated. Users can select whether they want the event order to be sent to same side of the trade (*Same*) or the opposite side.
- b. **Type:** There are 7 different types of order types: SD_ID_Fill (A Fill previous stored on the cloud by the position manager), Unknown, Other, Limit, Market, Stop, StopLimit, and ManualFill.
- c. **Account:** Account associated with the strategy.
- d. **Remove:** Delete this pane from the window and strategy.
- e. **Instrument:** The contract the event order uses.
- f. **Time In Force:** Select GTD or GTC orders.
- g. **Edit Qty:** When this button is clicked, a window pops up and prompts the user to enter a quantity. Users can enter a formula developed in the *Formula Audit* window by using the drop down menu at the bottom left of the window.
- h. **Edit Price:** When this button is clicked, a window pops up and prompts the user to enter a price. Users can enter a price or a formula developed in the *Formula Audit* window.
- i. **Enabled:** Turn on the strategy when selected.

3. Formula:

- a. **Sell/Buy:** Select whether the order is on the buy or sell side of the option.
- b. **Don't Cross:** When checked, orders in the market do not cross one another. When unchecked, orders are allowed to cross.

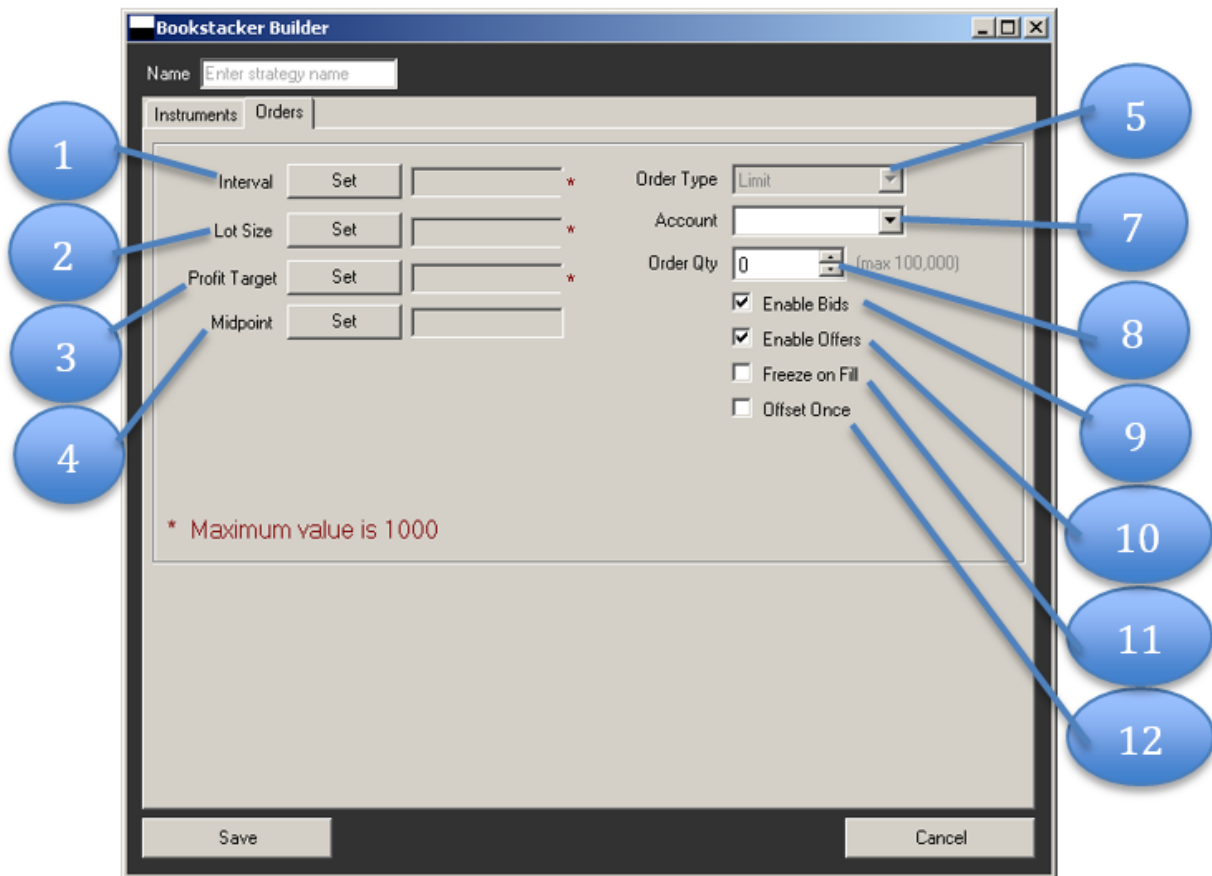
- c. **Show:** When checked, working orders appear in the market. When unchecked, orders are only placed when they can be filled immediately.
- d. **Type:** Order type. Limit is the default setting.
- e. **Account:** Account associated with the strategy.
- f. **Remove:** Delete this pane from the window and strategy.
- g. **Max Qty:** Set the maximum allowed working quantity of the strategy.
- h. **Edit Qty:** When this button is clicked, a window pops up and prompts the user to enter a quantity. Users can enter a formula developed in the *Formula Audit* window by using the drop down menu at the bottom left of the window.
- i. **Edit Price:** When this button is clicked, a window pops up and prompts the user to enter a price. Users can enter a price or a formula developed in the *Formula Audit* window.
- j. **Enabled:** Turn on the strategy when selected.

125. **Bookstacker**

A bookstacker strategy allows users to place several orders in the market at multiple prices and then adjust those orders based on market movement. As with the *Formula Strategy* window, users first choose the desired instrument via the *Instrument Select* tab and then select the *Orders* tab to create the strategy. Refer to section 7.8.1.1 to learn how to select instruments.

The bookstacker logic uses two different types of orders: initiating orders and offset orders. When enabled, a bookstacker order will send as many initiating orders as set in *Order Qty* on each side of the market that is checked. Initiating orders will move in relation to their midpoint and interval until they are filled. When an initiating order is filled, an offset order is sent according to the profit target and offset criteria.

Orders are sent in relation to a set midpoint, profit target, lot size, interval, and order quantity. Midpoint, profit target, lot size, and interval can be set as the output of a formula, and *Order Qty* is a pre-set, static variable.



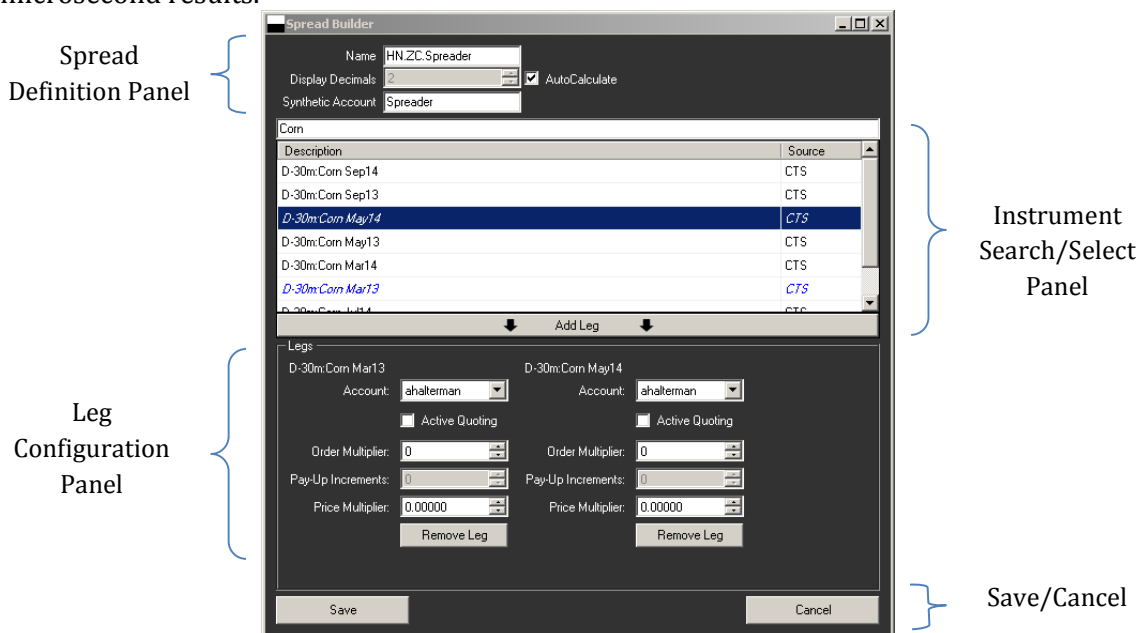
126. Orders Tab

1. **Interval:** The number of ticks between each level of the bookstacker strategy.
2. **Lot Size:** Number of contracts traded per order.
3. **Profit Target:** Profit margin (in ticks) that Gatekeeper attempts to meet.
4. **Midpoint:** Price that the bookstacker strategy will use to determine where to place orders.
5. **Order Type:** Type of order submitted (limit).
6. **Stop Market:** Use the limit price as the trigger price; offsetting orders will also be sent as stop market orders.
7. **Account:** Account associated with strategy.
8. **Order Qty:** Number of orders the bookstacker strategy places on each side of the market. For example, an *Order Qty* of 10 will submit 20 orders if both bids and offers are enabled.
9. **Enable Bids:** Bookstacker strategy is applied to the buy side of the market.
10. **Enable Offers:** Bookstacker strategy is applied to the sell side of the market.
11. **Freeze on Fill:** All remaining initiating orders will stop moving in relation to the pre-set midpoint, and will instead assume whatever the midpoint was at the time the first initiating order was filled.

12. **Offset Once:** When enabled, offset orders will not offset when filled. Instead, a new initiating order will be sent at a price determined by the current midpoint and interval.
 - a. **Do Not Re-Initiate:** Upon the successful completion of a buy or sell (in either order), bookstacker does not enter a new order. For example, if a user is working 4 orders on either side of the midpoint and a buy side order gets filled and its corresponding sell side also gets filled (completing the trade), Gatekeeper does not go back to working 4 orders on either side, rather, it works 3 on the bid side (since the first one was filled) and 4 on the sell side.

127. SpreadBandit

Spreadbandit strategies use Gatekeeper's advanced spread engine to deliver sub-microsecond results.



128. Spread Definition Panel

- a. **Name:** Name of spreader instance.
 - b. **Display Decimals:** Manually enter the display decimals.
 - c. **Auto Calculate:** Automatically calculate the proper display decimals.
129. **Synthetic Account:** The account name that will show up in all the account drop downs throughout GateKeeper.
130. **Instrument Search/Select Panel:** Search for and select the instruments to use in the spreader.

131. Leg Configuration Panel

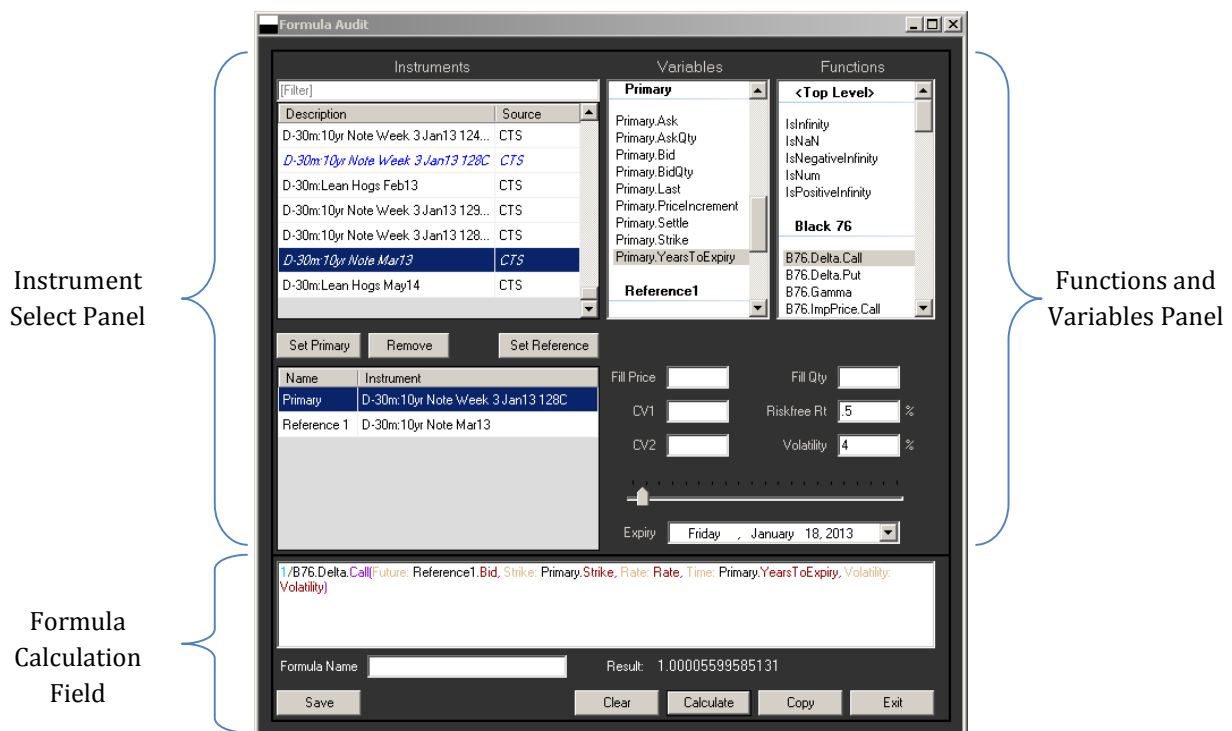
- a. **Account:** Account associated with spreader instance.
- b. **Active Quoting:** When selected, Gatekeeper places orders in that leg according to the user's specified parameters.
- c. **Order Multiplier:** Determine parameters of what the spreader will do upon a fill in one leg of the spread. If it is positive, the order submitted will be on the same side; if it is negative, it will be on the opposite side. The size

of the integer determines how to scale the spread quantity for order submissions.

- d. **Price Multiplier:** Used to enter a ratio value that equals the prices in the legs of the spreader (For example, 1:1 when dealing with contracts that are equivalent).
 - e. **Remove Leg:** Removes leg that was added to the spreader instance.
132. **Save/Cancel:** Save or cancel a spreader instance.

133. Formula Audit

The *Formula Audit* window can be used as a computational tool or to create and test formulas that can be applied in other Gatekeeper windows. The formulas developed in this window can be applied to any correct set of variables for the given formula. The *Formula Audit* window is divided into three different sections: *Instrument Select Panel*, *Formula and Variable Panel*, and *Formula Calculation Field*.



134. **Instrument Select Panel:** Choose the primary instrument and any reference instruments. This panel is similar to other instrument selection panels throughout Gatekeeper. It displays the available contracts. It allows users to filter, search. Through the *Set Primary*, *Remove*, and *Set Reference* buttons, you can select which contracts are to be used while testing formulas. As contracts are selected, the *Variables* pane populates.

Note: Setting a primary or a reference instrument in the formula auditor does not create a global association throughout the application. The names “Primary” and “Reference[n]” are intended to provide a layer of abstraction between the instrument and the formula so that a single formula can be used on multiple instruments.

135. **Functions and Variables Panel:** This panel is used to select the formula to be calculated and set variables (including constant values set by the user). When a formula is selected, it automatically appears in the *Formula Calculation Field*.
136. **Formula Calculation Field:** Displays and calculates the formula selected and allows users to name and save the formula. Whether the formula deals with a call or a put is in purple; if a variable is undefined it is in blue; if a variable is defined it is in red; definition of formula component is in tan; any computational text entered by the user ("1/" in the example above) is in cyan. Gatekeeper uses formulas computed in this field to perform its calculations in strategies.

7.1.1 Variables Reviewed

There are 21 (more depending on how many reference instruments are included) variables that can be later included in formulas developed in *Formula Audit*. Below is a detailed explanation of these variables.

1. General Variables

1. **CV1:** A constant value used for computation entered by the user.
2. **CV2:** Another constant value used for computation entered by the user.
3. **False:** Returns the value of 0, signifying a false Boolean statement.
4. **Inf**
5. **NaN:** Stands for not a number.
6. **Rate**
7. **True:** Returns the value of 1, signifying a true Boolean statement
8. **Volatility:** The volatility of a specific instrument.
9. **YearsToExpiry:** The amount of time a specific instrument expires.
10. **Fill.Price:** The price to fill
11. **Fill.Qty:** The quantity of instruments.
12. **Math.E:** The value of e
13. **Math.PI:** The value of Pi (π).

2. Instrument Variables

The following variables will be preceded by either *Primary* (indicating it references the primary instrument for calculation) or *ReferenceX* (X being the number, in order of assignment, of the reference instrument, indicating it references the corresponding reference instrument for calculation). These variables appear once a primary instrument is selected.

1. **.Ask:** Current on-the-market ask price for the instrument.
2. **.AskQty:** Current on-the-market quantity of offers at the ask price of the instrument.
3. **.Bid:** Current on-the-market bid price for the instrument.
4. **.BidQty:** Current on-the-market quantity of bids at the bid price of the instrument.
5. **.Last:** Most recent or last price traded in the instrument.
6. **.PriceIncrement:** The size in decimals of one price increment (tick).

7. **.Settle:** Settle price of the instrument.
8. **.Strike:** Strike price of the instrument (will not be displayed if the instrument is a futures contract).
9. **.YearsToExpiry:** Date of expiration of an instrument.

10. Functions Reviewed

There are 66 different functions in 4 categories: Boolean operators, Black–Scholes 76, Black–Scholes, and math. Below is a detailed explanation of these formulas.

11. Boolean Operators

Used as Boolean operators in formulas.

1. **IsInfinity:** Returns 1 when the result of the operator is infinity.
2. **IsNaN:** Returns 1 when the result of the operator is NaN (Not a Number).
3. **IsNum:** Returns 1 when the result of the operator is a real number.
4. **IsPositiveInfinity:** Returns 1 when the result of the operator is positive infinity.

12. Black–76

Variables used in these formulas include: futures contract, strike price of the option, risk-free rate, time till delivery, and volatility.

1. **B76.Delta.Call:** The degree to which a change in price in the underlying instrument affects the price of the call option (commonly used in hedge ratios).
2. **B76.Delta.Put:** The degree to which a change in price in the underlying instrument affects the price of the put option (commonly used in hedge ratios).
3. **B76.Gamma:** As a derivative of delta, it measures the velocity at which the price of the option changes in relation to the price of the underlying.
4. **B76.ImpPrice.Call:** Calculate the implied price of the futures contract based on the price of the call.
5. **B76.ImpPrice.Put:** Calculate the implied price of the futures contract based on the price of the put.
6. **B76.ImpVol.Call:** The implied volatility for call options.
7. **B76.ImpVol.Put:** The implied volatility for put options
8. **B76.Price.Call:** The implied price of a call option based on the futures price.
9. **B76.Price.Put:** The implied price of the put option based on the futures price.
10. **B76.Rho.Call:** The degree to which a change in the risk-free interest rate will affect the price of the call.
11. **B76.Rho.Put:** The degree to which a change in the risk-free interest rate will affect the price of the put.
12. **B76.Theta.Call:** The degree to which a change in the time till expiration affects the price of the call.
13. **B76.Theta.Put:** The degree to which a change in the time till expiration affects the price of the put.
14. **B76.Vega:** The degree to which change in volatility affects the price of the option.

13. Black–Scholes

1. **BS.Charm.Call:** The instantaneous rate of change of delta for a call option over the passage of time (delta decay).
 2. **BS.Charm.Put:** The instantaneous rate of change of delta for a put option over the passage of time (delta decay).
 3. **BS.Color:** The rate of change of the gamma of an option over the passage of time (gamma decay).
 4. **BS.Delta.Call:** The degree to which a change in price in the underlying instrument affects the price of the call option (commonly used in hedge ratios).
 5. **BS.Delta.Put:** The degree to which a change in the price in the underlying instrument affects the price of the put option (commonly used in hedge ratios).
 6. **BS.DualDelta.Call**
 7. **BS.DualDelta.Put**
 8. **BS.DualGamma**
 9. **BS.Gamma:** As a derivative of delta, it measures the velocity of a change in the underlying price affects the value of the option.
 10. **BS.ImpPrice.Call:** The implied price based on implied volatility of a call option.
 11. **BS.ImpPrice.Put:** The implied price based on implied volatility of a put option.
 12. **BS.ImpVol.Call:** The implied volatility of the call.
 13. **BS.ImpVol.Put:** The implied volatility of the put.
 14. **BS.Price.Call:** The theoretical price of the call.
 15. **BS.Price.Put:** The theoretical price of the put.
 16. **BS.Rho.Call:** The degree to which a change in the risk-free interest rate will affect the price of the call.
 17. **BS.Rho.Put:** The degree to which a change in the risk-free interest rate will affect the price of the put.
 18. **BS.Theta.Call:** The degree to which a change in the time till expiration affects the price of the call.
 19. **BS.Theta.Put:** The degree to which a change in the time till expiration affects the price of the put.
 20. **BS.Vanna:** The second order derivative of the option value
 21. **BS.Vega:** The degree to which a change in volatility affects the price of the option.
 22. **BS.Volga:** Measures second order sensitivity to volatility.
14. **Math**
1. Math.Abs:
 2. Math.Acos:
 3. Math.Asin:
 4. Math.Atan:
 5. Math.Ceiling
 6. Math.Cos
 7. Math.Cosh
 8. Math.Exp
 9. Math.Floor

10. Math.Log10
11. Math.Ln
12. Math.Sign
13. Math.Sin
14. Math.Sinh
15. Math.Sqrt
16. Math.Tan
17. Math.Tanh
18. Math.Truncate
19. Math.Atan2
20. Math.IEEERemainder
21. Math.Max
22. Math.Min
23. Math.Pow
24. Math.Round

15. How to: Create a Formula

Formulas can be used to compute fair value of an option or as part of a defined strategy (as covered in *Formula Strategy Builder* section 7.8.1). Once a formula has been created, it can be saved and used for different strategies with different contracts. Once a user creates a function for one strategy, the user can easily apply the created strategy to other strategies and contracts. The following example uses Black–76 Price Call formula with Mini-Dow Dec 13 15000 Calls.

16. **Select Instruments:** Using the *Instrument Select Panel*, set the primary and reference instrument to be used in the strategy.

Description	Source
SIM:Mini-Dow Dec13 14300C	CTS
SIM:Mini-Dow Dec13 14200P	CTS
SIM:Mini-Dow Dec13 14200C	CTS
SIM:Mini-Dow Dec13 14100P	CTS
SIM:Mini-Dow Dec13 14100C	CTS
SIM:Mini-Dow Dec13 14000P	CTS
SIM:Mini-Dow Dec13	CTS
SIM:Mini-Dow Dec13 14000C	CTS

Set Primary Remove Set Reference

Name	Instrument
Primary	SIM:Mini-Dow Dec13 15000C
Reference 1	SIM:Mini-Dow Dec13

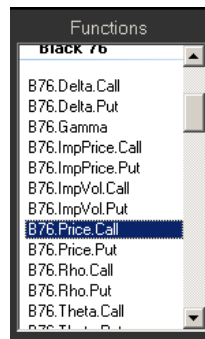
17. **Set Volatility and Risk-free Rate:** Enter the volatility percentage. This can later be changed in the *Strategy Window* via *Volatility Edit* (section 7.7.3). Enter the risk-free rate. For this example, volatility is set at 4% and the risk-free rate is at 0.5%.

Fill Qty

Riskfree Rt %

Volatility %

18. **Select Function:** In the *Functions and Variables Panel*, select the desired function. It will appear in the *Formula Calculation Field*. For this example, Black–76 Price Call will be used.



19. **Determine Variables:** In the *Formula Calculation Field*, the Black-76 Price Call formula will appear as: B76.Price.Call(Future: Future, Strike: Strike, Rate: Rate, Time: Time, Volatility: Volatility). This is a textual representation of the formula Gatekeeper uses to make its computations. Purple indicates whether the formula is for a call or a put; words in orange with a colon next to them represent the part of the formula that will be computed; words in blue following the orange words represent variables that have yet to be defined; words in red following the orange words represent variables that have been defined. In this example, the future being used, the strike price, and the expiry time are undefined and are in blue. The risk-free rate and volatility have already been defined (in step 2) so they are in red.

B76.Price.Call(Future: Future, Strike: Strike, Rate: Rate, Time: Time, Volatility: Volatility)

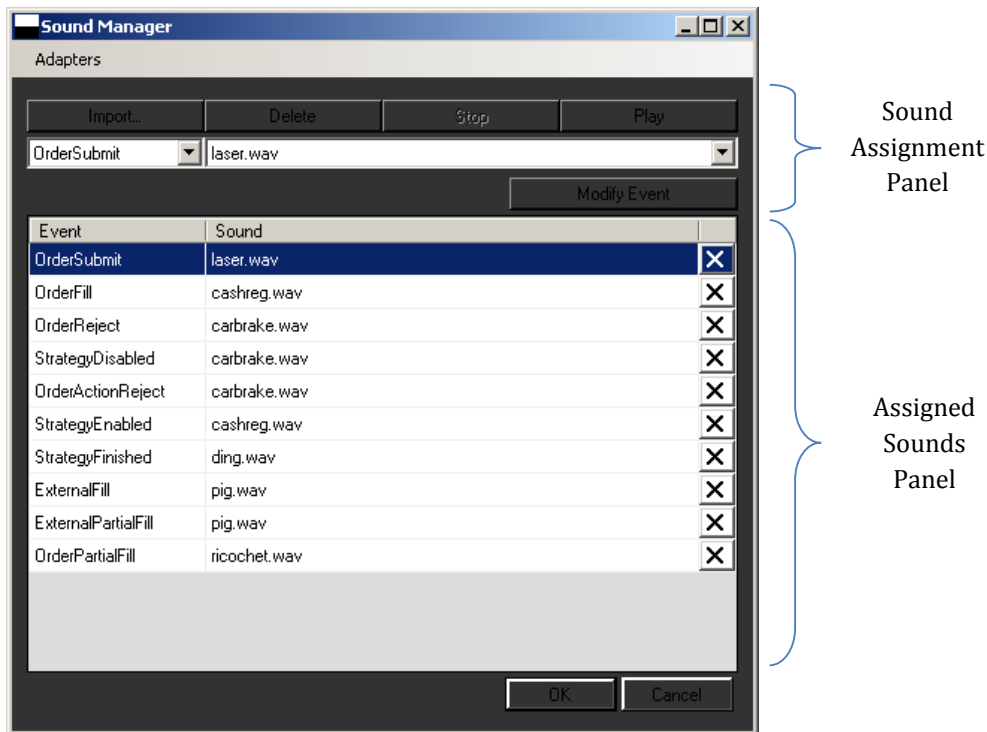
20. **Define Variables:** To make this a complete formula, all the undefined (blue) variables need to be defined (red). To do this, select the word in blue by double clicking on it. This will highlight the word “Future.” In the variables pane, double click on “Reference1.Bid.” This will replace the blue word “Future” with “Reference1.Bid.” This process is repeated for strike (Primary.Strike) and time (Primary.YearsToExpiry).
21. **Calculate:** Now that the variables have been defined, click the *Calculate* button. If done correctly, a number should appear next to *Result*.



22. **Save Formula:** Once the formula has been created, it should be saved. This opens up a *Saved Formula* panel in the *Formula Audit* window and enables users to use this formula again both in *Formula Audit* and in *Strategy Builder*.

23. Sound Manager

Gatekeeper offers the option of pairing actions performed in Gatekeeper with sound alerts. This feature is set up in *Sound Manager*. The window has two main panels, the *Sound Assignment Panel* and *Assigned Sounds Panel*. Users can assign sounds to be paired with the following actions: order submit, order fill, order partial fill, order reject, order delete, order action reject, strategy enabled, strategy disabled, strategy finished, external fill, and external partial fill.



24. How to: Import Sounds into Gatekeeper

In order to access any sounds through Gatekeeper, users must first import the sound files.

25. **Click the *Import* button:** clicking the *Import* button brings up a file locator window on the user's computer.
26. **Select Sounds:** Once the sound files are found, select the desired sounds files.
27. **Import sounds:** Click *Open* and the chosen files will be imported into Gatekeeper.
28. **Preview/Delete:** Users can preview the sound selected or delete it by clicking the *Preview* and *Delete* buttons respectively in this panel.
29. **How to: Assign Sounds, Change Sounds, or Delete Sounds**
30. **Select Event:** Use the drop down menu that lists actions that can be paired with sounds.
31. **Set sound:** Use the drop down menu with the sounds loaded in it.
32. **Delete/Augment (Optional):** Users can delete a sound by selecting the *X* button that appears in the right-most column or change sound assignments by selecting the action and selecting a new sound.
33. **Set sounds:** Once the user is done managing sounds, click *Modify Event*. The sound assignment will then appear in the *Assigned Sounds Panel* and the user can select *OK* to confirm any changes.

8. Licensing

Licenses for Gatekeeper are configured by Scaled Dynamics' account managers. If users have any questions about their current license, they can contact their account manager or email support@scaledynamics.com.

9. Additional Information

Any additional inquiries or requests for added functionality should be directed to sales@scaledynamics.com. Any support-related inquiries should be directed to support@scaledynamics.com. For additional information on Scaled Dynamics, Inc. and its products, visit www.scaledynamics.com.

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